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**SURFACE WATER
MANAGEMENT & MAINTENANCE PLAN
FOR
RESIDENTIAL DWELLING
RAMSBOTTOM LANE, RAMSBOTTOM, BURY
FOR
YARN ESTATES**

Project : 2024.052
Date : 08.09.2025

Contents

1.0	Introduction	1
1.1	Management Arrangements	1
2.0	Surface Water - Soakaways	2
2.1.	Overview	2
2.2.	Operation & Maintenance Requirements	2
2.3.	Regular Maintenance Inspections & Reporting	3
3.0	Surface Water Sewer – Petrol Oil Separators	5
3.1.	Overview	5
3.2.	Operation & Maintenance Requirements	5
3.3.	Regular Maintenance Inspections & Reporting	7

1.0 Introduction

Yarn Estates have appointed Graham Schofield Associates Ltd to provide a Management & Maintenance plan for the surface water drainage system for a proposed new dwelling at Ramsbottom Lane, Ramsbottom, Bury.

This document is provided to satisfy Bury Council's Lead Local Flood Authority (LLFA) requirement, *"No development shall take place until a scheme for the maintenance and upkeep of the surface, water drainage system proposed for that development site has been submitted to and approved in writing by the Local Planning Authority. The maintenance plan shall be carried out in full thereafter. This scheme shall include details of any drainage elements that will require replacement within the lifetime of the proposed development."*

1.1 Management Arrangements

The initial maintenance of all the drainage systems will be the responsibility of the developer. When the property has been completed it will be the responsibility of the future owners to maintain and inspect the system.

The Maintenance Plan should be considered as a live document with items tailored to reflect the requirements of the development site.

2.0 Surface Water Sewer – Soakaway

2.1. Overview

The discharge of surface water runoff to the soakaway below the surface of the access drive will ultimately return to natural groundwater. Hence any runoff should be suitably clean so that the groundwater is not put at risk of contamination.

Effective upstream treatment is necessary to remove sediment to prevent long-term blockage and subsequent failure of the system. In this regard, regular inspections of the drainage channels and trapped gullies installed in the access drive and parking areas are required as silting of the 'pots or debris causing blockages in the gully grates will reduce the effectiveness of the road gullies and likely cause ponding in the access drive.

Regarding the soakaway, easy access shall be provided by way of removable manhole covers and frames to enable regular inspections to establish the effectiveness of the soakaway and to facilitate the cleaning thereof.

In landscaped areas, root ingress from trees and shrubs near to the pipework and soakaway may also affect the functionality of the system or encroach into the soakaway chamber causing partial blockage. Hence periodic inspections of the system will be required.

Prior to connection to the existing network, all new manholes need to be inspected for construction debris which should be removed, with pipe test plugs or temporary caps to be removed, benching to be properly finished, the correct access facilities securely fixed. All chamber covers, grates & their frames should be the correct load rating to cater for the loads acting on them during construction and during their service life particularly where they are required to be traffic bearing.

2.2. Operation & Maintenance Requirements

Regular inspection and maintenance is important for the effective operation of the surface water drainage systems. Maintenance responsibility for a surface water sewer system should always be placed with an appropriate organization, which should have a site-specific schedule of work which itemises the tasks to be undertaken and the frequency at which they will be performed.

Adequate access must be provided to all areas for inspection and maintenance, including for appropriate equipment and vehicles. Operation and maintenance requirements for Surface Water Sewer Piped Attenuation Systems are described in Table 1.

Table 1 SW to Soakaway - Operation & Maintenance Requirements

Maintenance Schedule	Required Action	Frequency
Regular Maintenance	Cleaning of gutters and any filters in downpipes	Annually or as required depending on season

	Inspect for sediment, litter and debris in soakaway, inverts of all inlet / outlet manholes & inspection tubes.	Monthly for first 3 months, followed by quarterly thereafter.
	Inspect for sediment, litter, and debris inside of silt traps, inspection chambers.	Monthly for first 3 months, followed by quarterly thereafter.
	Trimming any roots that may be causing blockages.	Annually or as required
Occasional Maintenance	Remove sediment and debris from gullies and grates, inside of concrete chamber rings.	As required, based on inspections
Remedial Actions	Repairs to road gullies and grates.	As required
	Repairs to manhole benching, covers & frames.	As required
	Removal of silt & root ingress in pipe network.	As required
Monitoring	Inspect silt traps and note rate of sediment accumulation	Monthly in the first year then annually
	Check pipes for root ingress and joint displacement particularly in landscaped areas.	Annually or as required

2.3. Regular Maintenance Inspections & Reporting

Regular inspections will:

- help determine optimum future maintenance activities
- confirm hydraulic, water quality, amenity and ecological performance
- Allow identification of potential system failures, e.g. blockage, poor discharge, poor water quality etc.

It is vital that a record is kept of the inspections & maintenance work that has been carried out. This allows the response of the system to different maintenance regimes to be assessed in the future.

During the first year of operation, inspections should ideally be carried out after every significant storm event to ensure proper functioning, but in practice this may be difficult or impractical to arrange.

Maintenance will usually be carried out manually, although a suction tanker can be used for sediment/debris removal silt traps and larger systems. If maintenance is not undertaken for long periods, silt deposits can become hard-packed and require greater effort to remove.

An important part of a management plan is an annual and 3-5 yearly review of the Maintenance Plan – when maintenance contracts are typically renewed. This should apply to all types of privately maintained drainage systems, including landscaping. The review should involve those responsible for the maintenance and those undertaking the work and should reflect any changes to the site and changes to adjacent sites that may impact the site.

3.0 Surface Water Sewer – Petrol Oil Separators

NOT REQUIRED FOR THIS DEVELOPMENT.

3.1. Overview

The discharge of surface water runoff from the geocellular attenuation system below the surface of the access road will ultimately return to a watercourse. Hence any runoff should be suitably clean so that the groundwater is not put at risk of contamination.

Separators can be fitted to surface water drainage systems to protect the environment from pollution by oils. They separate the oils from the water, and then retain the oil safely until it is removed. They are installed to contain oil leaks from vehicles and plant and accidental spillages. To be effective, oil separators need to be correctly designed, installed, and maintained.

Effective upstream treatment is necessary to remove sediment to prevent long-term blockage and subsequent failure of the system. In this regard, regular inspections of the trapped gullies installed in the access road and parking areas are required, as silting of the 'pots' or debris causing blockages in the gully grates will reduce the effectiveness of the road gullies.

Full retention separators are used where there is a risk of regular contamination with oil and a foreseeable risk of significant spillages e.g. vehicle maintenance areas and retail fuel forecourts.

Bypass separators fully treat all flows, for the area served, generated by rainfall rates of up to 6.5 mm/hour. This covers most rainfall events. Flows above this rate can bypass the separator. These separators are used when it is considered an acceptable risk not to provide full treatment for high flows, e.g. where only small spillages can occur and the risk of spillage is small such as on short stay car parks.

Silt capacity for a bypass separator must be provided either upstream of the separator or in the bypass weir chamber, and not in the main oil separating chamber which would likely affect the operation of the separator, the skim pipe, or the bypass device.

Separators must be provided with a robust device to provide visual and audible warning (if necessary to a remotely located supervisory point) when the level of oil reaches 90 per cent of the oil storage volume (V) under static liquid level conditions. This automatic warning device indicates that the separator needs immediate emptying for it to continue to work effectively.

Also, as the build-up of silt will prevent the separator from working effectively, it is recommended that a silt level alarm or another suitable device is installed in the separator to provide an alert as to the build-up of excessive levels of silt. In many cases, oil and silt alarms can be fitted to an existing separator.

Further equipment can be fitted to the separator, alongside a closure device and warning device, to alert the site operator to the routine maintenance requirements of the separator. This equipment might, for example, indicate when the next inspection is due and such 'separator management systems' will ensure that the separator continues to receive the appropriate level of attention.

Following separation of any oils, the runoff water from the full retention separator discharge into the existing surface water outfall sewer (600mm diameter) located within the development site area. Flow into both separators is controlled by upstream the flow control manhole to 5 l/s.

3.2. Operation & Maintenance Requirements

Regular inspection and maintenance is important for the effective operation of the surface water drainage systems. Maintenance responsibility for a surface water sewer system should always be placed with an appropriate organization, which should have a site-specific schedule of work which

itemises the tasks to be undertaken and the frequency at which they will be performed.

Once the installation of the separator is completed and after the system is made live, it should be inspected monthly for the first three months and thereafter at six monthly intervals.

Adequate access must be provided to all areas for inspection and maintenance, including for appropriate equipment and vehicles. Operation and maintenance requirements for Surface Water Sewer Petrol Oil Interceptor is described in Table 1.

Table 1 SW Sewer Petrol Oil Interceptor Systems Operation & Maintenance Requirements

Maintenance Schedule	Required Action	Frequency
Regular Maintenance	Physically inspect the integrity of the separator and all mechanical parts	Bi-annually or as required
	Assess the depth of accumulated oil and silt	Bi-annually or as required
	Inspect for sediment, litter, and debris inside of gullies, silt traps, inspection chambers.	Monthly for first 3 months, followed by quarterly thereafter.
	Service all electrical equipment such as alarms and separator management systems	Bi-annually or as required
	Normal emptying of the separator, it will need to be emptied right away if oil or silt levels exceed 90 per cent of the storage volume of the separator and the alarm is activated	Bi-annually or as required
	Check the condition of any coalescing device and replace it if necessary	Bi-annually or as required
Occasional Maintenance	Remove sediment and debris separators.	As required, based on inspections
	Empty the separator as soon as a significant quantity of oil and/or silt has built up. The retained waste, including the silt, must be removed and the separator must be refilled with clean water before being put back in to service to prevent damage and to prevent oil passing through it.	As required, based on inspections
	Separator to be emptied & given a general inspection to test the integrity and performance of the system. The separator must be refilled with clean water following such an inspection.	Every 5 years

	Repair / replace damaged or defective electrical equipment such as alarms and separator management systems	As required
Monitoring	Inspect silt traps and note rate of sediment accumulation	Monthly in the first year then annually
	Separator Control chamber	First 3 months, thereafter 6 monthly

3.3. Regular Maintenance Inspections & Reporting

Regular inspections will:

- help determine optimum future maintenance activities
- confirm hydraulic, water quality, amenity, and ecological performance
- Allow identification of potential system failures, e.g. blockage, silt and oil build up, poor discharge, poor water quality etc.

A detailed record should be kept of when the separator is inspected, maintained, emptied, and serviced. In addition, specific events relating to the separator system such as cleaning, repairs, accidents, and incidents should also be kept. This allows the response of the system to different maintenance regimes to be assessed in the future.

When the oil or silt reaches the level, which requires its removal from within the separator, employ a registered waste removal company to empty it. For all waste removal operations ensure that the waste removal company has experience in emptying separators and that they do not allow any of the contents to escape from the outlet during emptying.

An important part of a management plan is an annual and 3-5 yearly review of the Maintenance Plan – when maintenance contracts are typically renewed. This should apply to all types of privately maintained drainage systems, including landscaping. The review should involve those responsible for the maintenance and those undertaking the work and should reflect any changes to the site and changes to adjacent sites that may impact the site.